

# Peter Lyons & Associates

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Building Energy Consultants  
Window Energy Simulation Laboratory  
NFRC Partner Country Certified Simulator



## Energy Simulation Rating Report

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**Product Manufacturer**  
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31 May 2009

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**Frame Type:** Not Applicable (glazing/shading system only)  
**Operator Type:** Not Applicable (glazing/shading system only)  
**Glazing System:** Clear 4mm glass outer layer with In'Flector<sup>®</sup> inner layer (as defined below)  
**Model/series:** In'Flector<sup>®</sup> - PRELIMINARY REPORT  
**Modelling software:** Optics 5.1.(Maintenance Pack 2)  
WINDOW 5.2.17a

Product	Glazing System	U-value (W/m <sup>2</sup> .K)	Solar Heat Gain Coeff- icient (SHGC) (-)	Visible Trans- mittance (VT) (-)
In'Flector centre-of- glass (no frame)	4mm clear glass (IGDB #9802) outer 50mm air gap In'Flector inner	2.7	0.39	0.24

Signature of Simulator  
In-Responsible-Charge:

A handwritten signature in black ink, appearing to read 'Peter Lyons'.

## Notes

1. Energy Rating properties on Page 1 of this report are based on NFRC 100-2001 environmental conditions and were generated using current versions of Optics 5.1 and WINDOW 5.2. These environmental conditions are for benchmarking purposes only. Peter Lyons & Associates (PLA) does not imply or claim that the product simulated in this report will necessarily perform as stated in actual, variable conditions of use.
2. Calculations in this report were performed with WINDOW 5.2 rather than WINDOW 6.2 'Research Version', pending resolution of several issues with the latter.
3. Energy Rating properties on Page 1 of this report refer to 'centre of glass' region, without frame. Calculations are based on specular optical properties only (no diffuse transmission or reflection).
4. Calculations in this report assume air space between glass and In'Flector is well sealed.
5. Information in this report does not meet the full reporting requirements for NFRC certification. This report should be regarded as a research-grade, partial report.
6. Spectral data supplied by Client and based on average over three samples. Spectrophotometric measurements supplied by Optical Data Associates. Wavelength range: 0.3 $\mu$ m - 25 $\mu$ m.
7. Rated properties are based on NFRC technical procedures NFRC 100-2004 (U-factor) and NFRC 200-2004 (Solar Heat Gain Coefficient). The terms "U-factor" and "U-value" are synonymous.
8. This report does not constitute complete certification of this product and only relates to the glazing system simulated.
9. Rounding of values in this report is 1 decimal place for U-factor and 2 decimal places for SHGC, per NFRC unit conversion and rounding policy, modified for the needs of SI units.

<p><i>Report Number:</i> PLA-0905-01</p> <p><i>Database File:</i> TBA</p> <p><i>Report Date:</i> 31-May-09</p> <p><i>Revision(s):</i> -</p> <p><i>Expiration (est):</i> 31-May-13</p> <p><i>IA Code:</i> To be determined</p> <p><i>Recertification:</i> No</p>
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## APPENDIX 1. WINDOW 5.2 DETAILED REPORT, centre-of-glass properties

Window 5.2a v5.2.17a Glazing System Thermal and Optical Properties 05/31/09 03:14:12

ID : 7318  
**Name** : In'Flector over 4mm clear using detailed ODA SD  
 Tilt : 90.0  
 Glazings: 2  
 KEFF : 0.2553  
 Width : 54.800  
**Uvalue** : **2.71** ...**Thermal transmittance**  
**SHGCc** : **0.38** ...**Solar heat gain coefficient**  
**SCc** : **0.45** ...**Shading coefficient**  
**Vtc** : **0.24** ...**Visible transmittance**  
 RHG : 300.88

Glass and Gas Data for Glazing System '7318 In'flector over 4mm clear using detailed ODA SD'

ID	Name	D(mm)	Tsol	1	Rsol	2	Tvis	1	Rvis	2	Tir	1	Emis	2	Keff
-----															
Outside															
9802	CLEAR4.LOF	# 4.0	.814	.074	.074	.893	.082	.082	.000	.840	.840	1.00			
	1 Air	50.0													.255
57006	InFlectorODA-me#	0.8	.259	.486	.085	.257	.480	.086	.000	.699	.866	.510			
-----															
Inside															

Environmental Conditions: 1 NFRC 100-2001

	Tout (C)	Tin (C)	WndSpd (m/s)	Wnd Dir	Solar (W/m2)	Tsky (C)	Esky
Uvalue	-18.0	21.0	5.50	Windward	0.0	-18.0	1.00
Solar	32.0	24.0	2.80	Windward	783.0	32.0	1.00

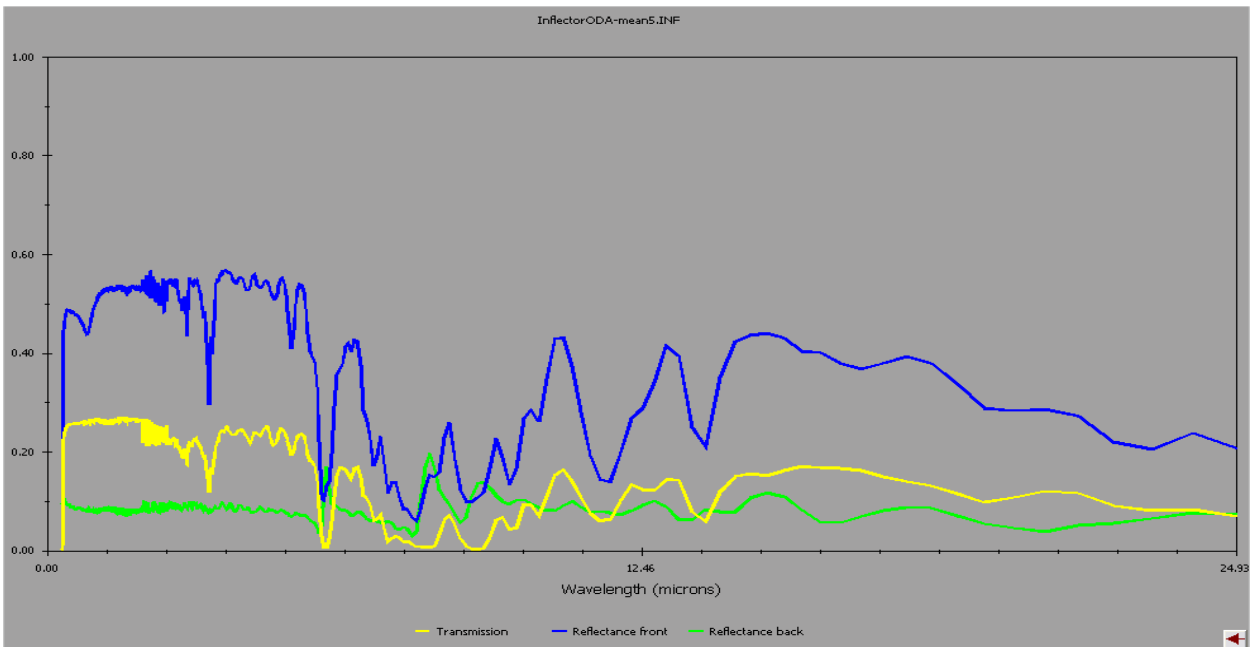
Optical Properties for Glazing System '7318 In'flector over'

Angle	0	10	20	30	40	50	60	70	80	90	Hemis
Vtc	: 0.239	0.240	0.237	0.233	0.227	0.217	0.193	0.146	0.074	0.000	0.203
Rf	: 0.481	0.477	0.476	0.477	0.483	0.496	0.524	0.594	0.743	1.000	0.512
Rb	: 0.092	0.085	0.083	0.086	0.096	0.115	0.150	0.240	0.475	0.999	0.142
Tsol	: 0.219	0.220	0.216	0.212	0.206	0.195	0.173	0.129	0.062	0.000	0.183
Rf	: 0.411	0.407	0.405	0.405	0.407	0.416	0.440	0.504	0.654	1.000	0.435
Rb	: 0.090	0.082	0.081	0.084	0.094	0.112	0.148	0.238	0.473	0.999	0.139
Abs1	: 0.155	0.156	0.158	0.163	0.168	0.175	0.181	0.184	0.171	0.000	0.169
Abs2	: 0.215	0.217	0.220	0.221	0.218	0.214	0.206	0.183	0.112	0.000	0.204
SHGCc	: 0.385	0.387	0.386	0.383	0.376	0.364	0.337	0.278	0.160	0.000	0.343
Tdw-K	: 0.179										
Tdw-ISO	: 0.217										
Tuv	: 0.169										

Temperature Distribution (degrees C)

	Winter		Summer	
	Out	In	Out	In
Lay1	-14.4	-14.0	38.6	38.9
Lay2	6.7	6.9	41.9	41.8

## APPENDIX 2. SPECTRAL DATA



**Figure 1.** Optical performance of In'Flector (from ODA data supplied by Client and processed using Optics 5.1). *Blue:* front reflectance (aluminised side); *green:* back reflectance (black side); *yellow:* transmittance. Data points represent average over three samples.